

CLAIMS

What is claimed is:

1. A network element residing in an optical transport network, comprising:
an optical transport line terminating at the network element, the optical transport line operable to carry an optical system signal therein;
a demultiplexing component connected to the optical transport line, the demultiplexing component operable to receive the optical system signal and separate the optical system signal into a plurality of intermediate optical signals; and
a plurality of optical fibers connected to the demultiplexing component, each of the optical fibers operable to carry one of the plurality of intermediate optical signals and an optical management signal therein, the optical management signal being transmitted at a wavelength different than the wavelength range used to transmit the intermediate optical signal.
2. The network element of Claim 1 wherein the optical management signal is transmitted at a wavelength that is spectrally separated from the transmission wavelength range for the plurality of intermediate optical signals.
3. The network element of Claim 2 wherein the plurality of intermediate optical signals are transmitted at a wavelength in the range of 1520nm to 1610nm and each of the optical management signals are transmitted at substantially 1310nm.

4. The network element of Claim 1 wherein the optical management signal is transmitted at a wavelength that is not suitable for transmitting intermediate optical signals having an optical reach greater than 1000km.

5. The network element of Claim 1 wherein the optical management signal is transmitted in the absence of the intermediate optical signal.

6. The network element of Claim 1 further comprising a plurality of management signal sources interposed between the demultiplexing component and the plurality of optical fibers, where each of the management signal sources is operable to introduce an optical management signal into a corresponding optical fiber.

7. The network element of Claim 6 wherein at least one of the management signal sources includes a laser source operable to generate an optical management signal, and a signal combiner operable to combine the optical management signal from the laser source with the intermediate optical signal traversing through the corresponding optical fiber.

8. The network element of Claim 1 further comprising a plurality of management signal receivers connected to the plurality of optical fibers, each of the management signal receivers operable to receive and separate the optical management signal from the intermediate optical signal traversing through the corresponding optical fiber.

9. A method for managing an optical transport network, comprising:
- terminating an optical transport line at a network element residing in the optical transport network, the optical transport line operable to carry an optical system signal and the optical system signal having a plurality of optical data signals embodied therein;
- routing the plurality of intermediate optical signals amongst a plurality of optical fibers associated with the network element; and
- defining an optical management channel for each of the plurality of optical fibers, the optical management channel operable to carry an optical management signal therein.
10. The method of Claim 9 further comprising the step of transmitting a first optical management signal over at least one of the optical management channels, the first optical management signal transmitted at a wavelength different than the wavelength range used to transmit an optical data signal through the corresponding optical fiber.
11. The method of Claim 10 wherein the step of transmitting a first optical management signal further comprises selecting a wavelength that is spectrally separated from the wavelength range used to transmit the optical data signal.
12. The method of Claim 11 wherein the first optical management signal is transmitted at substantially 1310nm and the optical data signal is transmitted at a wavelength in the range of 1520nm to 1610nm.

13. The method of Claim 10 wherein the step of transmitting a first optical management signal further comprises selecting a wavelength that is not suitable for transmitting optical data signals having an optical reach greater than 1000km.

14. An optical transport network, comprising:

a plurality of network elements residing in the optical transport network;
a plurality of optical transport lines interconnecting the plurality of network elements, each optical transport line operable to carry an optical system signal and the optical system signal having a plurality of optical data signals embodied therein; and

a plurality of optical fibers associated with each network element, each of the optical fibers operable to carry one or more optical data signals and an optical management signal therein, the optical management signal being transmitted at a wavelength different than the wavelength range used to transmit the optical data signals through the corresponding optical fiber.

15. The optical transport network of Claim 14 wherein the optical management signal is transmitted at a wavelength that is spectrally separated from the wavelength range used to transmit the optical data signals.

16. The optical transport network of Claim 15 wherein optical management signal is transmitted at substantially 1310nm and the optical data signals are transmitted at a wavelength in the range of 1520nm to 1610nm.

17. The optical transport network of Claim 14 wherein the optical management signal is transmitted at a wavelength that is not suitable for transmitting optical data signals having an optical reach greater than 1000km.

18. The optical transport network of Claim 14 wherein the optical management signal is transmitted in the absence of the optical data signals.